Clinical-Pathological Conference†

Case History: A retired business man, aged 63 years, entered the hospital with complaint of dry hacking unproductive cough of six months' duration and with increasing dyspnea of four months' duration. The patient was transported by plane and during the trip was markedly dyspneic, requiring oxygen. There had been a weight loss of 22 pounds in the preceding six months.

The patient had a history of cerebrovascular accident three years previously and anterior myocardial infarctions three years and one year previously. During this latter episode he had unexplained hematuria on several occasions. Five years before entering the hospital he had been treated for duodenal ulcer.

Physical Examination: On admission to hospital, the patient's temperature was 37.2°, pulse 116, respiration 40, blood pressure 160/92. Patient was an apprehensive, moderately obese individual, pale and markedly dyspneic, requiring continuous oxygen by nasal catheter. The thorax was symmetrical and resonance was slightly impaired over both bases posteriorly, greater on left. Slight impairment to percussion was noted below the right third rib anteriorly. There were numerous fine dry crackling rales over the right side of chest below the second rib. Medium coarse rales and high-pitched ronchi were present over the left side of chest anteriorly and over both lower lobes posteriorly. Rales were unchanged post-tussively. The heart was not enlarged; there was sinus tachycardia, and the tones were of fair quality, without murmurs. The remainder of the physical examination was negative except for tenderness and a questionable mass in the epigastrium.

Laboratory Examinations: Hemoglobin was 14.5 gm., RBC numbered 4,430.000, WBC 12,900 with 86 per cent neutrophiles (3 per cent nonfilamented), 9 per cent lymphocytes, 4 per cent monocytes and 1 per cent eosinophiles. Specific Gravity of the urine was 1.010; it contained no albumen, casts or red cells. The sedimentation rate was 40 mm. in one hour (Westergren). The blood serology was negative. A coccidioidin skin test was negative, while a tuberculin patch test was faintly positive. The sputum was mucoid and scant in amount and when examined both by wet mount and by paraffin section, it contained no neoplastic cells, nor fungi. The specimen was composed chiefly of mucus with numerous polymorphonuclears and many masses of bacteria surrounded by cellular debris and resembling "salivary corpuscles."

A bedside film of the chest showed diffuse soft parenchymal infiltration throughout both lungs, somewhat confluent in the middle third of each lung field. The infiltration was patchy in type. The trachea was deviated toward the right as were the heart and mediastinal structures. The dome of the right diaphragm was somewhat elevated.

Course: The patient's dyspnea continued severe with respiratory rate of 35 to 40, pulse 100-120. The temperature was 37.2° to 37.8° and terminally 38.3°. Under general supportive therapy, continuous oxygen inhalation and mild sedation, the patient steadily declined and expired on the eighth day of hospitalization.

Clinician's Discussion:* The predominant symptom this patient presented was dyspnea of long standing and of increasing proportions, proceeded by a dry hacking cough. Referring to the brief past history, we first think of congestive heart failure as the primary reason for hospitalization, as an aftermath of coronary occlusions which he had had three years and one year previously. We know that the patient had generalized arteriosclerosis as well as coronary sclerosis as evidenced by his blood pressure of 169/92, and a history of cerebrovascular accident three years previously, and probably a renal infarction one year previously. However, this patient was not suffering from congestive heart failure. He was not cyanotic in spite of dyspnea; his lungs were not wet; he did not have edema of the ankles on admittance, his heart was not enlarged. The picture was not that of a terminal phase of cardiovascular renal disease with both cardiac and renal failure. The urine was negative. One wishes that levels of NPN or Urea Nitrogen in the blood on admission to the hospital were included in the laboratory findings.

In an effort then to arrive at a diagnosis, we think of many things and rule them out one by one. *Advanced Tuberculosis:* This may cause dyspnea, far out of proportion to the findings. We can rule this out because the cough is nonproductive, the sputum was mucoid and free from tubercle bacilli, the tuberculin skin test was only faintly positive and the x-ray findings were not those of tuberculosis. *Coccidioides:* The patient was flown in by plane, suggesting that he was brought from an isolated area in one of the rural districts, and of course in California one thinks of Coccidioidal infection. However, this patient's skin test was negative. Then, too, the x-ray findings were not suggestive of Coccidioidal infection.

We of course must include *pneumonia* or *pneumonitis* in the general picture. We rule out these at once as the primary cause of the disease because of the long standing history and because the temperature elevations were not high enough, the cough was non-productive over a long period of time and the x-ray findings were not typical.

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What, then, does this lead us to? We have an individual who, though he is still obese, has lost 20 pounds in six months. He does not have tuberculosis; he does not have lues; he does not have congestive heart failure. He was treated for duodenal ulcer five years ago. We do not know whether existence of an ulcer was proven by x-ray; we do not know if his symptoms had completely subsided; we do not know if there has been an x-ray check to prove that the ulcer was healed. Aside from the pulmonary physical findings, the remainder of the examination was negative except for tenderness and a questionable mass in the epigastrium.

What, then, could best explain the symptom complex? Carcinoma involving the lung? Dyspnea is one of the earliest and most common symptoms and may occur out of all proportions to the amount of damage done or to the physical findings. Dyspnea is usually constant as in the case of this patient. If there is some degree of atelectasis, the dyspnea might be augmented. That this was quite possible is borne out by the fact that there was a deviation of the trachea, heart and mediastinum to the right. The physical findings that are recorded are entirely consistent with carcinoma of the lung. The tender epigastric mass could represent metastatic involvement of the liver. Since the dome of the right diaphragm was somewhat elevated, carcinoma of the stomach was more likely than primary carcinoma of the liver.

Other sources must be considered. The bleeding that was noted in the urine one year previously when the patient had his last coronary occlusion might be indicative of significant disease in the kidneys. However, I feel that it is more likely that this would be explained on a basis of a renal infarction, and I feel that the fact that the patient was treated five years previously for supposedly benign lesion in the upper gastrointestinal tract is quite important in his history. A very rapid sedimentation rate would fit in with carcinoma. The story of the patient's progress, fever, elevated white count, the findings of masses of bacteria grouped around the white cells in the sputum, leads me to postulate a secondary terminal infection of pneumonitis which hastened death. So, in summing all things up, I think we can make a diagnosis of:

1. Carcinoma of the lung, metastatic with a superimposed terminal secondary pneumonitis, the carcinoma probably secondary to a gastric or duodenal lesion.

2. Generalized arteriosclerosis with healed myocardial and renal infarctions.

*Pathologist's Discussion:*** The patient's lungs were almost solidly infiltrated by innumerable small irregularly shaped metastases which were white in color. There did not appear to be enough uninvolved lung to permit the patient to breathe as long as he did. The primary tumor measured 4 x 3 x 2.5 cm. and occupied the lower pole of the right kidney, deforming the lower calyx. The renal tumor was bright yellow in color and in all respects a typical renal adenocarcinoma. The only other metastases were to the mediastinal nodes, enlargement of which produced the deviation of the trachea.

There was a well healed duodenal ulcer present just below the pylorus. There were several old fibrotic scars in the myocardium and an old thrombosis with complete occlusion of the circumflex branch of the left coronary artery.

Hematuria, as in this case, may be the only symptom pointing to a carcinoma of the kidney and it is not unusual to have the episodes of hematuria separated by months or years. Hematuria is said to be present in 60 to 80 per cent of all cases of carcinoma of the kidney and to be the initial symptom in 60 per cent.

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